Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SEVENTH SEMESTER B.TECH. (INSTRUMENTATION & CONTROL ENGG.)

END SEMESTER DEGREE EXAMINATION, DEC - 2017

SUBJECT: DIGITAL IMAGE PROCESSING [ICE 4021]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A.	What are the fundamental steps in digital image processing	4
1B.	Explain the process of image formation in human eye with an example.	3
1C.	Define following terms: 1. Connectivity 2. Spatial resolution 3. Pixel	3
2A.	Explain the process of sampling and quantization with an example	4
2B.	Explain the importance of gray level resolution in image processing with an example.	3
2C.	What are the different processing levels in digital image processing? Give an example for each.	3
3A.	What is histogram matching? Compute the histogram equalization for the following distribution having eight gray levels. A = {460, 102, 850, 656, 329, 245, 122, 81}	4
3B.	Explain any two types of operator with its structure used for edge detection.	3
3C.	What is image degradation/restoration process, explain with its model.	3
4A.	Describe different types of redundancy with an example.	4
4B.	What are lossless compression techniques? Compute the Huffman coding for the following probability distribution. A = {0.04, 0.3, 0.06, 0.1, 0.07, 0.03, 0.1}	3
4C.	Discuss the active feature processing stages of an object detection system.	3
5A.	Compare subjective and objective fidelity criteria with a suitable example.	4
5B.	Design a frequency domain approach for multi-dimensional data processing for object recognition in frequency domain.	3
5C.	Write a short note on: i) Gaussian Noise ii) smoothing filters	3